CPCCo Central Plateau Cleanup Company

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Standards

CPCC-STD-EN-40280

PRC-STD-EN-40280

Engineering Specifications

Revision 0, Change 3

Published: 11/29/2022
Effective: 11/29/2022

Program: Engineering
Topic: Engineering Program

Technical Authority: Lovelace, John
Functional Manager: Clare, Aaron

Use Type: Administrative

- Solid Waste Operations Complex :
  Excluded from USQ
  Exclusion Reason:
  N/A per CPCC-PRO-NS-53097 Table 1
- Canister Storage Building/Interim Storage Area :
  Excluded from USQ
  Exclusion Reason:
  N/A per CPCC-PRO-NS-53097 Table 1
- Central Plateau Surveillance and Maintenance :
  Excluded from USQ
  Exclusion Reason:
  N/A per CPCC-PRO-NS-53097 Table 1
- Waste Encapsulation Storage Facility :
  Excluded from USQ
  Exclusion Reason:
  N/A per CPCC-PRO-NS-53097 Table 1
- Plutonium Finishing Plant :
  Excluded from USQ
  Exclusion Reason:
  N/A per CPCC-PRO-NS-53097 Table 1
- Transportation :
  Excluded from USQ
  Exclusion Reason:
  N/A per CPCC-PRO-NS-53097 Table 1
- Capsule Storage Area :
  Excluded from USQ
  Exclusion Reason:
  N/A per CPCC-PRO-NS-53097 Table 1
- 105 KW Facility :
  Excluded from USQ
  Exclusion Reason:
  N/A per CPCC-PRO-NS-53097 Table 1
- 324 Building :
  Excluded from USQ
  Exclusion Reason:
  N/A per CPCC-PRO-NS-53097 Table 1

JHA: Administrative
Periodic Review Due Date:12/30/2025
Rev. 0, Chg. 3

Change Summary

Description of Change

Updated to recognize CSI MasterFormat as a recommended but not required specification format.

TABLE OF CONTENTS

List of Appendixes

1.0 INTRODUCTION

1.1 Purpose

This standard establishes the requirements applicable to engineering standards prepared and revised in support of Central Plateau Cleanup Company (CPCCo) engineering design activities.

1.2 Scope

This standard applies to engineering specifications prepared to support engineering design, construction, fabrication, and procurement activities performed in support of CPCCo. Engineering specifications shall be prepared in accordance with this standard and CPCC-PRO-EN-440, *Engineering Document Change*.

1.3 Applicability

This standard applies to engineering specifications prepared in support of facility modifications, formal projects, and procurement of equipment and/or services.

1.4 Implementation

This standard is effective upon publication.

2.0 STANDARD

2.1 General Specification Content

General content of a specification includes the following elements:

1. Title and unique number or identifier
2. Revision number and Date of last effective revision
3. Change record to summarize the chronological development, and revision date
4. Table of Contents
5. Author or person and responsible organization
6. Approval signatures
7. Purpose, scope, and intended use of the specification
8. Terminology, definitions, and abbreviations
9. Test methods for measuring all specified characteristics
10. Material requirements: physical, mechanical, electrical, chemical, etc. - Targets and tolerances
11. Performance testing requirements - Targets and tolerances
12. Drawings, photographs, or technical illustrations
13. Workmanship
14. Certifications required

15. Safety considerations and requirements
16. Environmental considerations and requirements
17. Quality control requirements, acceptance sampling, inspections, acceptance criteria
18. Completion and delivery
19. Provisions for rejection, corrective measures, and re-inspection
20. References
21. Appendices

2.2 Equipment Specification Template

Appendix A provides a general specification template that may be used for a variety of equipment specification needs.

2.3 Test Specifications

Test specifications are prepared in accordance with CPCC-PRO-EN-286, *Testing of Equipment and Systems*.

2.4 CSI MasterFormat™ for Construction Specifications

Preparation of equipment, component, or construction specifications for CPCCo construction activities should use the numbering and title conventions defined in the CSI MasterFormat™ 2004 Edition – Numbers and Titles. The CSI MasterFormat™ is a useful guide for construction specification content even if the specific numbering and title conventions are not strictly followed.

Construction specifications prepared by CPCCo staff that may be useful for other CPCCo construction activities may be submitted to the CPCCo Central Engineering organization for inclusion on the CE web site. Specifications provided on the CE web site can be used as is or as a basis for preparation of needed specifications.

2.4.1 EFCOG/LANL Master Specifications

Through agreements made with the Energy Facilities Contractors Group (EFCOG), Los Alamos National Laboratory (LANL) has made its set of Master Specification available to U.S. Department of Energy (DOE) Contractor personnel to use as examples for creation of specifications for equipment, components, and construction activities.

The LANL Master Specifications are organized in accordance with the numbering and title standards defined in the Construction Specifications Institute (CSI) MasterFormat™. These specifications are in MicroSoft Word format and may be used as a guide in developing construction specifications for CPCCo activities.

The LANL Master Specifications are available on the CPCCo Central Engineering (CE) web site on the Engineering Tools and Aids web page located at:

http://prc.chprc.rl.gov/rapidweb/Engineering/index.cfm?Page Num=11

3.0 FORMS

None.

4.0 RECORD IDENTIFICATION

All records are required to be managed in accordance with CPCC-PRO-IRM-10588, *Records Management Processes*.

Records created during the performance of OCRWM activities shall be managed and additionally submitted to the OCRWM Records Coordinator in accordance with CPCC-PRO-QA-19579, *OCRWM Records Management.*

Records Capture Table

Name of Record	Submittal Responsibility	Retention Responsibility
Engineering Specifications	Preparer / Design Authority	DMCS/IDMS
Engineering Specifications (OCRWM)	Preparer / Design Authority	OCRWM Records Coordinator

5.0 SOURCES

5.1 Requirements

CPCC-RD-EN-1819, *Engineering Requirements*

5.2 References

CPCC-PRO-EN-286, *Testing of Equipment and Systems*
CPCC-PRO-EN-440, *Engineering Document Change*
CPCC-PRO-IRM-309, *Controlled Software Management*
CPCC-PRO-IRM-10588, *Records Management Processes*
CPCC-PRO-QA-19579, *OCRWM Records Management*

Appendix A - General Equipment Specification Template

SPECIFICATION FOR (Title of Equipment Item)
System No.
Equipment No.

1.0 SCOPE

Provide a clear, concise abstract of the scope of work. Include a brief description of the function and the application for the item.

2.0 APPLICABLE DOCUMENTS

In Sections 2.1 and 2.2, list documents from which requirements have been specifically identified as part of the design definition in the specification. Specify the document number and title, and include the specific issue or revision as necessary to control the configuration or implementation of the item, material, or process. The form and wording to be used is as follows:

> "The following documents, of the exact issue shown, form a part of the Basis of Design to the extent specified in the applicable sections of this document. In the event of a conflict between documents referenced herein and the requirements of this specification, the requirements of this specification shall take precedence."

2.1 Government Documents

List applicable Federal and state specifications, standards, regulations, drawings, and other publications.

2.2 Non-Government Documents

List the applicable documents, codes, standards, and commercial data. If no documents of these types are applicable, provide a statement indicating this.

3.0 TECHNICAL REQUIREMENTS

Use subsections as needed to define the equipment covered by the specification in terms of the minimum requirements needed to satisfy the design needs. Reference codes, standards, and regulations that must be met and specific definitions as to the portion of the equipment or degree to which they apply.

Do not duplicate information shown on referenced drawings. Reference drawings should show location, dimensional sizes, and arrangements. When referencing a drawing, include the latest revision number (e.g., Drawing H-14-0102442, Rev. 3). Delete references to any Hanford Site contractor's name and use the drawing number only. If a non-Hanford Site company's drawings and specifications are referenced, use the name of the firm as well as the number, if such data does not involve use of proprietary information. List references to multiple drawings in ascending numerical sequence in a column to permit rapid checking. Do not state the words "Latest Revision." List the sheet numbers of all required sheets and their revision numbers. Do not note exceptions in the DESCRIPTION to a drawing. A facility modification package (FMP) may be included instead of a revised drawing to expedite ordering.

3.1 Item Definition

Define the major physical/functional elements of the item and the applicable interface requirements.

3.1.1 Item Diagram

Specify the drawing number or include as a figure, the schematic/block or flow diagram for the item.

3.1.2 Interface Definition

Specify directly, or reference drawings and other documentation, the required physical and functional interfaces between the item and other co-functioning equipment and/or the facility. Specify the interfaces in enough detail to permit detail design. Dimension mechanical interface tolerances that permit the widest practical latitude in manufacture, while maintaining the integrity of the item.

Specify input and output requirements of functional interfaces such as temperature ranges, loads, thermal shock limitations, voltages, pressures, etc., with tolerances as broad as practical.

3.2 Characteristics

In the following subsections, define the required minimum performance characteristics of the item and any related considerations.

3.2.1 Functional Characteristics

Specify functional design requirements (inputs and outputs with minimum/maximum limits, operator considerations, etc.).

3.2.2 Physical Characteristics

Specify physical design requirements (weight limits, dimensional limits, etc.), including installation considerations.

3.2.3 Reliability

Specify reliability requirements/considerations and how they are to be verified/determined.

3.2.4 Maintainability

Specify maintainability characteristics that affect the design (lubrication, parts replacement and repair, spares, modular construction, test points, etc.) including, but not limited to, the following:

Maintenance and Repair Cycles. Specify frequency or availability requirements for maintenance of the component (scheduled maintenance every 40 operating hours, etc.).

Service and Access. Specify requirements for ease of service (access openings/spacing, self-test capability, inspection windows, test fixtures, sealed bearings, etc.). Include requirements for service (remove and replace only, bench repair, special tools, remote handling/maintenance, etc.) and for capability of the item to be drained, connected, discharged, etc.

3.2.5 Environment

Specify the environmental conditions (pressure, temperature, humidity, shock, radiation, etc.) that the item is expected to experience during operation, service, transportation, and/or storage.

3.2.6 Transportability and Storage

Specify the requirements and considerations (weight and size limits, disassembly, protective capability, pressurization, etc.) essential to making the item transportable and storable that could affect design.

3.2.7 Safety

Specify requirements relating to safety of operators, general public, or equipment. Identify safety related equipment and specify the requisite qualification (e.g., ASME Code, seismic qualification, IEEE Class 1E, high temperature). Specify applicable critical characteristic, safety requirements and features (fail-safe criteria, single-failure criteria, failure position on loss of power, interlocks, trips, pressure reliefs, check valves, leakage limits, etc.). Specify requirements to provide safety-grade monitoring and control functions and applicable set points, limits, and margins.

3.3 Design and Construction

Define specific physical requirements not defined elsewhere, such as those described below. Identify the top drawing for the item.

3.3.1 Parts/Materials/Processes

Define requirements for the selection of parts, materials, and processes to be used in producing the item. Use of toxic or other restricted substances requires compliance with applicable regulations of government agencies or industry safety standards. Specifically identify applicable portions of listed specifications and standards.

3.3.2 Industry and Government Standards

Specify the requirements governing the use of standard and commercial parts and processes.

3.3.3 Radiation

a. Electromagnetic. Define requirements, when applicable, in terms of limits of electromagnetic environment that the component must accept and/or generate.

Nuclear. Define requirements similar to 3.3.3.a.

3.3.4 Cleanliness

Define requirements for cleaning and/or cleanliness control significant to proper functioning of the item.

3.3.5 Corrosion of Parts

Specify requirements for corrosion protection, including restrictions on dissimilar metal couples.

3.3.6 Protective Coatings

Specify the finish process, colors, and type of finish required. Identify applicable specifications.

3.3.7 Interchangeability

Specify the assembly level at which components shall be interchangeable or replaceable, as a design consideration. Do not define conditions that control assignment of new part/identifying numbers.

3.3.8 Identification and Marking

Specify requirements for identification of the item, including marking methods and content/ legibility.

3.3.9 Nameplate

Specify the type, content, attachment requirements, and identification method to be used on the nameplate.

3.3.10 Human Engineering

Specify special or unique requirements (e.g., constraints on functions of personnel, communications, and personnel/equipment interactions). Identify areas where affects of human error would be particularly serious.

3.3.11 Qualification

Define requirements (project phasing, quantity of units, test conditions, etc.) for qualification of the item for design approval.

3.3.12 Document Submittal

Provide a schedule (list) of the documents required for design review/approval, item manufacture/procurement/test/operation and maintenance support. Specify delivery in terms of relationship to events (before fabrication, before shipment, etc.). List the documents to be submitted for approval, review, or information.

Specify that all drawings be reproducible or permanent copies. The vendor shall not place any proprietary legend or stamp on any data produced as a result of this specification. All shop drawings or other data are the property of DOE. As-built drawings should be required at the completion of construction.

NOTE: *Submission of drawings by the vendor for review or approval may relieve the vendor of certain responsibilities to meet the specifications under the purchase order, if the vendor meets all requirements of the drawings.*

3.3.13 Personnel and Training

Specify applicable requirements for personnel and their training.

4.0 QUALITY ASSURANCE REQUIREMENTS

Identify the inspections and tests required to determine that the item conforms to Section 3.0 and is acceptable for delivery in accordance with Section 5.0 requirements.

If possible, arrange this section to follow the order of requirements in Section 3.0. Indicate which inspections and tests apply directly to qualification/evaluation and which apply to product acceptance.

4.1 General

Specify general requirements for examinations, inspections, and testing in terms of responsibility for verification, qualification provisions, and verification methods. Identify those quality assurance provisions not directly associated with a specific examination, inspection, or test.

NOTE: *Computer software must satisfy verification and validation requirements in accordance with CPCC-PRO-IRM-309, Controlled Software Management.*

4.1.1 Responsibility for Verification

Identify who has responsibility for verification of the item. All test procedures and data sheets prepared for the verification are submitted to the buyer for approval.

4.1.2 Verification Methods

Identify the verification methods to be used. Couple each engineering requirement of Sections 3.0 and 5.0 with its complementing verification method in a table.

4.2 Qualification Verification

If Section 3.0 contains a qualification requirement, define the verification provisions in this section.

4.3 Inspections and Tests

Define reviews, inspections, tests, analyses, demonstrations, and documentation (including Section 3.3.10) required to verify that Sections 3.0 and 5.0 requirements have been satisfied. Include, as appropriate:

- Testing to ensure satisfaction of the specified functional requirements, under applicable environmental conditions, including leak and/or pressure testing where required.
- Measurement or comparison of the specified physical characteristics and, where appropriate, comparison with previous tests on similar equipment.
- Examination, with specific criteria, for workmanship.
- Post-delivery acceptance testing, if required. Identify specific responsibilities for buyer and seller for conduct of the testing.

5.0 PREPARATION FOR DELIVERY

5.1 General

Specify general requirements for preservation, packaging, and packing and package marking. State the conditions under which the requirements apply. Specify detailed requirements in Sections 5.2 through 5.6.

5.2 Preservation and Packaging

Specify requirements for internal protection of the item. Include information about cleaning, interior cushioning, drying, interior containers, preservation, inert environmental needs, and wrapping.

5.3 Packing

Specify requirements for the exterior shipping container or cover and define the storage environmental limits.

5.4 Marking

Specify the requirements for marking and labeling of shipping containers for safety, protection, and identification.

5.5 Handling

Specify handling requirements, including loading and unloading limitations, and any restrictions regarding hooks, bails, forklifts, etc.

5.6 Shipping

Specify limitations or special instructions on shipping.

6.0 NOTES

Do not specify any requirements in this section. Include only information of a general, explanatory nature (intended use, ordering data, definitions, explanation of administrative specifications, etc.).

7.0 APPENDIXES

These are parts of the specification that have been separated from the regular text for convenience. Examples of possible appendix content include management plans, classified information, and multi-page tables and/or lists